UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,359	10/15/2003	Masashi Sucnaga	117514	3364

25944 7590 05/02/2007

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
MUHAMMED, ABDUKADER S	
ART UNIT	**PAPER NUMBER**
2627	

MAIL DATE	DELIVERY MODE
05/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/684,359	SUENAGA ET AL.	
	Examiner	Art Unit	
	Abdukader Muhammed	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *20-26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19 and 27-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *20-26* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1 through19 and 27 through 31, drawn to optical disk, classified in class 369, subclass 275.4.

II. Claims 20 through 26, drawn to method for manufacturing a master disk using three different exposure intensities, classified in class 430, subclass 321.

2. The inventions are distinct, each from the other because:

3. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case invention I can be made by using a same exposure intensity and wider beam or length of exposure.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

6. During a telephone conversation with Kevin Jones on April 13, 2007 a provisional election was made with traverse to prosecute the invention of group I, claims 1 through 19 and 27 through 31. Affirmation of this election must be made by applicant in replying to this Office action. Claims 20 through 26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. An action on the merits of the claims to the elected invention should follow.

Priority

7. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 4 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 12 recite the limitation "the pits, which are formed in the identical groove of the grooves" in lines 2-3. It is not clear whether the pits (the first and the second pits) are located in the same/one groove or in two different grooves. For the purpose of prior art comparison it is assumed as if the first and the second pits are located in two different consecutive grooves.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claim 1-19 and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rilum et al. (US 7,054,260 B2) further in view of Suzuki et al. (JP 2002-237100, machine translation is included).

Regarding Claim 1, Rilum et al. teach an optical information-recording medium comprising a substrate (substrate 350, see figure 22) which is formed with a plurality of lands and grooves (see figure 20), and a recording layer (dye layer 355, see figure 22) and a reflective layer (reflective layer 355, see figure 22) which are provided on the substrate, the grooves including: a first groove (groove 311, see figure 20); a second groove which is formed with pits (groove 321, see figure 20); and a third groove which is formed with pits (groove 320, see figure 20), wherein: the third groove is arranged between the first groove and the second groove. Rilum et al. differ from the claimed invention in that they do not specifically show the third groove has pits with widths narrower than those of the pits of the second groove.

Suzuki et al. on the other hand teach width of grooves/pits increasing from the inner circumference to the periphery of the substrate (see page 3, paragraph [0012], lines 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the width of the groove/pits in the system of Rilum et al. since Suzuki et al. teach that using such

different size grooves prevents errors due to push pull signal and record sensibility (see page 3, paragraph [0011], lines 6-10 and paragraph [0012], lines 1-4).

Regarding Claim 2, as applied to claim 1 above, Suzuki et al. also teach $Wg \leq Wpb \leq Wp$ is satisfied provided that Wg represents a half value width of the first groove, Wp represents a half value width of the pit of the second groove, and Wpb represents a half value width of the pit of the third groove. Suzuki et al. shows the grooves on which the pits are formed have half-value widths increasing from inner to the outside periphery; see example 1 on page 9 and table 1.

Regarding Claim 3, as applied to claim 1 above, Suzuki et al. also teach $Tg \leq Tpb \leq Tp$ is satisfied provided that Tg represents a recording layer recess depth ranging from an interface between the recording layer and the reflective layer over a surface of the land to an interface between the recording layer and the reflective layer over the first groove, Tp represents a recording layer recess depth ranging from the interface between the recording layer and the reflective layer over the surface of the land to an interface between the recording layer and the reflective layer over the pit of the second groove, and Tpb represents a recording layer recess depth ranging from the interface between the recording layer and the reflective layer over the surface of the land to an interface between the recording layer and the reflective layer over the pit of the third groove. Suzuki et al. shows the depths are increasing in succession from inner to outside periphery; see page 5, paragraph [0024], lines 4-9 and table 1.

Regarding Claim 4, the combination of Rilum et al. and Suzuki et al. teach the limitations of claim 1 for the reasons discussed above. The combination of Rilum et al. and Suzuki et al. differ from the claimed invention in that they do not specifically disclose the ratio of the first pit and the second pit is in a range of $1 \leq W_2/W_1 < 1.2$ where W_1 represents a maximum width in a

radial direction of the substrate of the first pit, and W2 represents a maximum width in the radial direction of the substrate of the second pit.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the ratio the first pit and the second pit in a range of $1 \leq W2/W1 < 1.2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Regarding Claim 5, as applied to claim 1 above, Suzuki et al. also teach that the recording layer is formed of a dye (organic coloring matter; see page 1, paragraph [0001], lines 1-2).

Regarding Claim 6, as applied to claim 5 above, Suzuki et al. also teach each of the first groove, the second groove, and the third groove is formed so that a groove depth is successively deepened and a groove width is successively widened in a direction from an inner side to an outer side of the optical information-recording medium (the channel depth and/or groove width increases towards the periphery from the inner circumference; see page 3, paragraph [0012], lines 1-3).

Regarding Claim 7, the combination of Rilum et al. and Suzuki et al. teach the limitations of claim 2 for the reasons discussed above. The combination of Rilum et al. and Suzuki et al. differ from the claimed invention in that they do not specifically disclose a ratio Wp/Wpb between the half value width Wp and the half value width Wpb satisfies a range of $1.05 \leq Wp/Wpb \leq 1.15$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the ratio Wp/Wpb between the half value width Wp and the half value width Wpb within 1.05-1.15, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Regarding Claim 8, Rilum et al. teach an optical information-recording medium comprising a substrate (substrate 350, see figure 22) which is formed with a plurality of lands and grooves (see figure 20), and a recording layer (dye layer 355, see figure 22) and a reflective layer (reflective layer 355, see figure 22) which are provided on the substrate, the grooves including: a first groove (groove 310, see figure 20); a second groove (groove 311, see figure 20); and a third groove which is formed with pits (groove 320, see figure 20), wherein: the second groove is arranged between the first groove and the third groove (see figure 20). Rilum et al. differ from the claimed invention in that they do not specifically show the second groove has a width wider than that of the first groove.

Suzuki et al. on the other hand teach width of grooves/pits increasing from the inner circumference to the periphery of the substrate (see page 3, paragraph [0012], lines 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the width of the groove in the system of Rilum et al. since Suzuki et al. teach that using such different size grooves prevents errors due to push pull signal and record sensibility (see page 3, paragraph [0011], lines 6-10 and paragraph [0012], lines 1-4).

Regarding Claim 9, as applied to claim 8 above, Suzuki et al. also teach $Wg \leq Wgb \leq Wp$ is satisfied provided that Wg represents a half value width of the first groove, Wgb represents a

half value width of the pit of the second groove, and Wp represents a half value width of the pit of the third groove, and. Suzuki et al. shows the grooves on which the pits are formed have half-value widths increasing from inner to the outside periphery; see example 1 on page 9 and table 1.

Regarding Claim 10, as applied to claim 9 above, Suzuki et al. also teach the ratio Wgb/Wg between the half value width Wgb and the half value width Wg satisfies $1.05 \leq Wgb/Wg \leq 1.15$. Suzuki et al. disclose in table 1, sample 1 with half width of second groove 153 nm and half width of first groove 145 nm which gives a ratio of 153/145=1.055.

Regarding Claim 11, as applied to claim 8 above, Suzuki et al. also teach $Tg \leq Tgb \leq Tp$ is satisfied provided that Tg represents a recording layer recess depth ranging from an interface between the recording layer and the reflective layer over a surface of the land to an interface between the recording layer and the reflective layer over the first groove, Tgb represents a recording layer recess depth ranging from the interface between the recording layer and the reflective layer over the surface of the land to an interface between the recording layer and the reflective layer over the second groove, and Tp represents a recording layer recess depth ranging from the interface between the recording layer and the reflective layer over the surface of the land to an interface between the recording layer and the reflective layer over the pit of the third groove. Suzuki et al. shows the depths are increasing in succession from inner to outside periphery; see page 5, paragraph [0024], lines 4-9 and table 1.

Regarding Claim 12, the combination of Rilum et al. and Suzuki et al. teach the limitations of claim 8 for the reasons discussed above. The combination of Rilum et al. and Suzuki et al. differ from the claimed invention in that they do not specifically disclose the ratio of the first pit and the second pit is in a range of $1 \leq W2/W1 < 1.2$ where W1 represents a maximum

width in a radial direction of the substrate of the first pit, and W2 represents a maximum width in the radial direction of the substrate of the second pit.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the ratio the first pit and the second pit in a range of $1 \leq W2/W1 < 1.2$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Regarding Claim 13, as applied to claim 8 above, Suzuki et al. also teach that the recording layer is formed of a dye (organic coloring matter; see page 1, paragraph [0001], lines 1-2).

Regarding Claim 14, as applied to claim 13 above, Suzuki et al. also teach that the dye is an azo dye (see page 7, paragraph [0033], lines 1-4 and 7-9).

Regarding Claim 15, as applied to claim 13 above, Suzuki et al. also teach each of the first groove and the third groove is formed so that a groove depth is continuously deepened and a groove width is continuously widened in a direction from an inner side to an outer side of the optical information-recording medium (the channel depth and/or groove width increases towards the periphery from the inner circumference; see page 3, paragraph [0012], lines 1-3).

Regarding Claim 16, as applied to claim 15 above, Suzuki et al. also teach that $Wgi < Wgo \leq Wgb \leq Wp$ is satisfied provided that Wgi represents a half value width of the first groove positioned on the inner side of the optical information-recording medium, Wgo represents a half value width of the first groove positioned on the outer side of the optical information-recording medium, Wgb represents a half value width of the second groove, and Wp

represents a half value width of the pit of the third groove. Suzuki et al. shows the grooves on which the pits are formed have half-value widths increasing from inner to the outside periphery; see example 1 on page 9 and table 1.

Regarding Claim 17, the combination of Rilum et al. and Suzuki et al. teach the limitations of claim 16 for the reasons discussed above. The combination of Rilum et al. and Suzuki et al. differ from the claimed invention in that they do not specifically disclose the ratio Wgo/Wgi between the half value width Wgi and the half value width Wgo is in the range of $1.03 \leq Wgo/Wgi \leq 1.10$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the ratio Wgo/Wgi in the range of 1.03-1.10, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Regarding Claim 18, the combination of Rilum et al. and Suzuki et al. teach the limitations of claim 15 for the reasons discussed above. The combination of Rilum et al. and Suzuki et al. differ from the claimed invention in that they do not specifically disclose the ratio dgo/dgi is in the range of $1.00 < dgo/dgi \leq 1.10$ where dgi is the depth of the first groove positioned on the inner side of the optical information-recording medium from a substrate surface, and dgo is the depth of the first groove positioned on the outer side of the optical information-recording medium from the substrate surface.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the ratio dgo/dgi in the range of 1.00-1.10, since it has been held that

where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Regarding Claim 19, as applied to claim 15 above, Suzuki et al. also teach that Tgi=Tgo<Tgb<Tp is satisfied where Tgi represents a recording layer recess depth ranging from an interface between the recording layer and the reflective layer over a surface of the land to an interface between the recording layer and the reflective layer over the first groove positioned on the inner side of the optical information-recording medium, Tgo represents a recording layer recess depth ranging from the interface between the recording layer and the reflective layer over the surface of the land to an interface between the recording layer and the reflective layer over the first groove positioned on the outer side of the optical information-recording medium, Tgb represents a recording layer recess depth ranging from the interface between the recording layer and the reflective layer over the surface of the land to an interface between the recording layer and the reflective layer over the second groove, and Tp represents a recording layer recess depth ranging from the interface between the recording layer and the reflective layer over the surface of the land to an interface between the recording layer and the reflective layer over the pit of the third groove. Note that Suzuki et al. teach the channel depth is increasing successively from the inner circumference to the periphery; see page 3, paragraph [0012], lines 1-3, example 1 on page 9 and table 1.

Regarding Claim 27, Rilum et al. teach an optical information-recording medium comprising a substrate (substrate 350, see figure 22) which is formed with a plurality of lands and grooves (see figure 20), and a recording layer (dye layer 355, see figure 22) and a reflective layer (reflective layer 355, see figure 22) which are provided on the substrate, the grooves

including: a first groove (groove 310, see figure 20); a second groove (groove 311, see figure 20); a third groove which is formed with pits (groove 321, see figure 20), and a fourth groove which is formed with pits (groove 321, see figure 20), wherein: the first to fourth grooves are arranged in an order of the *first groove, the second groove, the fourth groove, and the third groove*. Rilum et al. differ from the claimed invention in that they do not specifically show that the second groove has a width wider than that of the first groove and that the fourth groove has pits with widths narrower than those of the pits of the third groove.

Suzuki et al. on the other hand teach width of grooves/pits increasing from the inner circumference to the periphery of the substrate (see page 3, paragraph [0012], lines 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the width of the groove/pits in the increasing order in the system of Rilum et al. since Suzuki et al. teach that using such different size grooves/pits prevents errors due to push pull signal and record sensibility (see page 3, paragraph [0011], lines 6-10 and paragraph [0012], lines 1-4).

Regarding Claim 28, as applied to claim 27 above, Suzuki et al. also teach that $Wg \leq Wgb \leq Wpb \leq Wp$ is satisfied provided that Wg represents a half value width of the first groove, Wgb represents a half value width of the second groove, Wp represents a half value width of the third groove, and Wpb represents a half value width of the fourth groove (the channel depth and/or groove width increases towards the periphery from the inner circumference; see page 3, paragraph [0012], lines 1-3).

Regarding Claim 29, the combination of Rilum et al. and Suzuki et al. teach the limitations of claim 28 for the reasons discussed above. The combination of Rilum et al. and

Suzuki et al. differ from the claimed invention in that they do not specifically disclose the ratio Wgb/Wg is in the range of $1.03 \leq Wgb/Wg \leq 1.15$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the ratio Wgb/Wg in the range of 1.03-1.15, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Regarding Claim 30, as applied to claim 27 above, Suzuki et al. also teach that the recording layer is formed of a dye (organic coloring matter; see page 1, paragraph [0001], lines 1-2).

Regarding Claim 31, as applied to claim 30 above, Suzuki et al. also teach each of the first groove, the third groove, and the fourth groove is formed so that a groove depth is successively deepened and a groove width is successively widened in a direction from an inner side to an outer side of the optical information-recording medium (the channel depth and/or groove width increases towards the periphery from the inner circumference; see page 3, paragraph [0012], lines 1-3).

Conclusion

12. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

Noda (US 6724717 B2) teaches an optical disc including a substrate having a top surface provided with a ROM area and a RAM area with grooves of different width and depth (see figures 1-3).

Fujita et al. (US 7038998 B2) teach an optical recording medium having wobbled and unwobbled grooves with different sizes alternately (see figure 9).

Ha et al. (US 6212158 B1) teach a hybrid optical recording medium having a substrate and a recording layer disposed over the substrate, the substrate having a read-only area in which a groove is modulated by depressions in the substrate and a recordable area in which the groove from the read-only area extends into the substrate in the recordable area (see figures 3 and 4).

Ogawa (US 5946288) teaches an optical recording medium having grooves formed on the substrate with different shape and size (see figures 4 and 9).

Deno et al. (US 6819650 B2) teach an optical disc having land pre-pits and variable groove depths (see figures 4 and 7).

Murata et al. (US 6686018 B2) teach an optical disk the guide grooves are formed with increasing groove width and groove depth from the inner circumference to the outer circumference (see figure 13).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdukader Muhammed whose telephone number is (571) 270-1226. The examiner can normally be reached on Monday-Thursday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

am
am
24 April 2007

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER